

105th Annual Meeting The Ohio Academy of Science

Hosted by Malone College, Canton
May 3-4-5, 1996

WELCOME!

Malone College welcomes you to the 105th Annual Meeting of The Ohio Academy of Science. We invite you to explore our campus and to share in the excitement and challenges represented in this program.

REGISTRATION

REGISTRATION IS REQUIRED FOR ALL MEETING PRESENTERS AND ATTENDEES. On-site registration will be available at a higher rate. Meals cannot be guaranteed after April 22, 1996.

To assure reservations for meals, forms must be received by The Ohio Academy of Science by April 22, 1996.

Please use Registration Form on last page. Please send the completed form and fees by April 22, 1996 to:

OAS Annual Meeting Registration
PO Box 12519
Columbus OH 43212-0519
Phone or FAX 614/488-2228

Registration by credit card or purchase order only will be accepted by FAX at 614/488-2228 (M-F 9:00 AM-5:00 PM). Your packet, tickets, receipt, and name tag will be ready at the meeting registration desk upon your arrival. For further information, please call 614/488-2228.

Friday May 3 and Saturday May 4

Registration will be held in Osborne Hall, Malone College from 8:00 AM - 3:00 PM. On-site registration is possible by check, VISA, or Mastercard.

PARKING

Use the Osborne Hall, Randall Campus Center, and Brehme Centennial Center Parking Lots. There will be no charge.

SMOKING AND ALCOHOL POLICY

Smoking and the use of alcohol are not permitted on campus.

MEALS

Friday, April 28. Pre-registration required for lunch and dinner on campus. A list of fast food restaurants near the Malone campus will be available at REGISTRATION.

Friday, May 3. 6:00 PM Joint Ohio Academy of Science-Ohio Biological Survey Dinner at the Brehme Centennial Center. (Reservations required by April 22)

Saturday, May 4. Preregistration by April 22 required for lunch and dinner on campus. A list of fast food restaurants near the Malone campus available at REGISTRATION.

OAS Annual Meeting Banquet at 6:30 PM in the Brehme Centennial Center. (Reservations required by April 22)

HOUSING

Please contact hotels and motels directly. The JACKSON BELDEN AREA is the closest location to Malone College. There is no headquarters hotel.

ALLIANCE AREA

Comfort Inn at Carnation Mall (216) 821-5555
2500 W. State St., Alliance OH 44601

Don Panchos Motor Inn (216) 823-4390
9 S. Union Ave., Alliance OH 44601

Super 8 Motel (216) 821-5688
2330 W. State St., Alliance OH 44601

CANTON DOWNTOWN AREA

Cannon Hilton (216) 454-5000
320 Market Ave., S. Canton OH 44702

JACKSON BELDEN AREA (Closest area to Malone College)

Best Suites of America (216) 499-1011
4914 Everhard Rd. NW, Canton OH 44718

Canton Days Inn (216) 493-8883
3970 Convenience Cir., Canton OH 44718

Country Hearth Inn (216) 494-6360
4475 Everhard Rd., Canton OH 44718

Comfort Inn Canton (216) 492-1331
5343 Broadmoor Cir., Canton OH 44709

Fairfield Inn by Marriott (216) 493-7373
5285 Broadmoor Cir. NW, Canton OH 44709

Hampton Inn (216) 492-0151
5335 Broadmore Cir., Canton OH 44709

Holiday Inn (216) 494-2770
4520 Everhard Rd. NW, Canton OH 44718

Park Resident Suites (216) 494-2233
4520 Everhard Rd. NW, Canton OH 44718

Red Roof Inn (216) 499-1970
5353 Inn Cir. NW, N. Canton OH 44702

Residence Inn
5280 Broadmoor Cir. NW, Canton OH 44709

Sheraton Inn Canton (216) 494-6494
4375 Metro Cir. NW, Canton OH 44720

Super 8 Canton North (216) 492-5030
3950 Convenience Cir., Canton OH 44718

MASSILLON AREA

Massillon Inn (216) 832-1538
412 Lincoln Way E., Massillon OH 44646

Super 8 Motel (216) 837-8880
242 Lincoln Way E., Massillon OH 44647

MINERVA

Great Trail Golf Course & Lodge (216) 868-6770
10154 Great Trail Dr., Minerva OH 44657

Palmantier Hotel (216) 868-3113
US Route 30, Minerva OH 44657

NORTH CANTON AREA

Best Western North Canton
6855 Sunset Strip Ave., N. Canton OH 44720

Harleigh Inn (216) 499-9900
500 N. Main St., N. Canton OH 44720

Motel 6 (216) 494-7611
6880 Sunset Strip NW, N. Canton OH 44720

GENERAL SCHEDULE

Friday, May 3, 1996

- 8:00AM - 3:00 PM Registration in Osborne Hall
- 8:00 AM - 10:00 AM The Ohio Academy of Science
Governing Council Meeting in
Randall Campus Center Round
Room
- 9:00 AM - 4:00 PM Concurrent Spring Meeting of
The Ohio Alliance for the
Environment [Additional \$15
registration fee required for those
attending the Academy's meeting.]
See page 5 for description.
- 1:00 PM - 3:00 PM WORKSHOP: *How do we assess
inquiry-based science education?*
Timken Hall 100
Isadore Newman, Presiding
See page 5 for description.
- 1:00 PM Introductory Internet Workshop
Cattell Library
See page 7 for description.
- 2:00 - 5:00 PM Ohio Biological Survey Execu-
tive Committee in Randall
Campus Center Round Room
- 2:30 PM Advanced Internet Workshop
Cattell Library
See page 7 for description
- 6:00 PM Joint OBS-OAS Dinner; Brehme
Centennial Center (reservations
by April 22)

Saturday, May 4, 1996

- 7:30 AM Special Environmental Sciences
breakfast by invitation only.
Hosted by METCALF & EDDY.
(must be pre-registered)
Brehme Centennial Center
- 7:30 AM Past Presidents' Breakfast,
Brehme Centennial Center

8:00 AM - 3:00 PM Registration in Osborne Hall

9:00 AM - 11:00 AM Morning poster and podium
presentations

Introduction to the Internet
Workshop - Cattell Library
See page

11:15 AM ALL ACADEMY LECTURE
Randall Campus Center
Stewart Community Room

Is Sustainable Development An Idea Whose Time Has Come?

THOMAS N. GLADWIN, Ph.D.
Professor of Management and
International Business
and Director, Global
Environment Program
Leonard N. Stern School of
Business
New York University

PROFESSOR GLADWIN RECEIVED HIS B.S. with Honors and Distinction in Business Administration from the University of Delaware in 1970. He received an M.B.A. with Distinction in 1971 and a Ph.D. in International Business and Natural Resource Policy in 1975 from the University of Michigan supported by a Tenneco National Scholarship in Industrial Ecology.

After Michigan he joined the Centre d'Etudes Industrielles in Geneva as a Rockefeller Foundation Post Doctoral Fellow in Environmental Affairs. Tom joined NYU in 1976 where he directs the Stern School's Global Environmental Management Program. He teaches courses in environmental management, sustainable enterprise, and corporate social responsibility. He is the recipient of 20 grants from foundations for research on environmental management and sustainable development, including a major National Science Foundation award in 1994 for development of a sustainability impact assessment system. He was awarded the "Stern School Teaching Award" in 1989 and the NYU Executive MBA Program Award for "Excellence in Teaching" in 1988 and 1990. Tom is the author of one hundred articles, cases and chapters on international and environmental management and six books: *Environment, Planning and the Multinational Corporation* (1977), *Multinationals Under Fire: Lessons in the Management of Conflict*, with Ingo Walter (1980), *Environmental Aspects of the Activities of Transnational Corporations* (1985), *Building the Sustainable Corporation: Creating Environmental Sustainability and Corporate Advantage* (1992), *Stakeholder Negotiations: Exercises in Sustainable Development*, with MEB (1996) and *Business, Nature and Society: Towards Sustainable Enterprise*, with Tara Krause (in progress). He has directed a number of major conferences, including the "Business Briefing on the Earth Summit and Sustainable Development" (1992). Tom has been an active teacher in multinational corporate executive programs (e.g., AT&T, Chase Manhattan, Columbia, European

Center for Public Affairs, General Electric, Global Public Affairs Institute, Hawaii, IBM, Michigan, NYU, Peat Marwick, United Technologies, South Carolina) and has served as a consultant to the Corporate Conservation Council of the National Wildlife Federation, Business Council for Sustainable Development, Environmental Protection Agency, O.E.C.D. Environment Directorate, National Science Foundation, United Nations, World Commission on Environment and Development, and numerous corporations.

He has recently chaired the International Management Division of the Academy of Management and currently serves on the Board of its new Organizations and Environment Interest Group. He also serves on the Editorial Boards of *Total Quality Environmental Management* and *Journal of Industrial Ecology*, as the North American Editor of *Sustainable Development*, as a member of The Educational Task Force of the President's Council on Sustainable Development, as a Senior Consultant to the Global Public Affairs Institute, as a Panel Chairman for the U.S. Congress Office of Technology Assessment, and as an Advisor or Board Member with Second Nature, The Greening of Industry Network, *Environment Weekly*, The Society for International Development, and Franklin Research and Development Corporation. He was the John M. Olin Foundation Distinguished Visiting Fellow at Oxford University during 1994. He serves as a Core Faculty Member in the HRH The Prince of Wales' Business & The Environment Programme held at the University of Cambridge each fall.

12:00 noon	Lunch in Brehme Centennial Center (must be pre-registered) or lunch on your own at local restaurants
1:00 PM - 2:00 PM	Follow-up Interactive Session with DR. THOMAS GLADWIN. <i>What difference will sustainable development make for MY community?</i> Randall Campus Center Stewart Community Room
2:00 PM - 5:00 PM	Afternoon poster and podium presentations
2:00 PM	Advanced Internet Workshop Cattell Library See page 7 for description
3:30 PM	Teaching Students to Use the Internet for Research Cattell Library See page 7 for description
5:30 PM	OFFICIAL NOTICE of Annual Business Meeting for Academy Members Only Timken Science Building 100
6:00 PM	Reception, Banquet and Awards Ceremony, Brehme Centennial Center

PRESIDENT'S ADDRESS

A Preview of Heartland Science:

Ohio's Heritage of Discovery and Innovation

BY

CHARLES E. HERDENDORF, PH.D.

CHARLES E. HERDENDORF is Emeritus Professor of Zoology at The Ohio State University. He joined The Ohio Academy of Science in 1961, and is now a Fellow and Life member. In 1991, he was a Centennial Honoree of the Academy. For eleven years he was Geologist and Lake Erie Section Head of the Division of Geological Survey, ODNR. At Ohio State, Dr. Herdendorf was the seventh director of the Franz Theodore Stone Laboratory at Put-in-Bay, and the founding Director of the Center for Lake Erie Area Research and the Ohio Sea Grant Program. He also served on the faculties of Geology, Natural Resources, and Zoology, teaching courses in limnology, oceanography, and wetland ecology. The author of numerous publications, Dr. Herdendorf's research fields include Great Lakes ecology, New Zealand estuaries, and deep-ocean environments.

Sunday, May 5, 1996

8:00 AM	Geology Field Trip - see page 7
10:00 AM	Plant Sciences Field Trip - see page 7

Special Acknowledgments

The Ohio Academy of Science and Malone College express their appreciation to

THE JANSON INDUSTRIES
THE HOOVER COMPANY
UNITED NATIONAL BANK & TRUST COMPANY
COOPER & ASSOCIATES, P.L.L.
ABB SERVICE INC. AND
METCALF & EDDY

for partial financial support of this meeting.

LOCAL ARRANGEMENTS COMMITTEE

Chair, ARNOLD FRITZ, PH.D.

OUR HOST:

ACADEMIC HIGHLIGHTS OF MALONE COLLEGE

Malone College, a Christian college for the arts, sciences, and professions, first opened its doors to six students as Cleveland Bible College in 1892. In 1957, the college moved to Stark County, changed its emphasis to Christian liberal arts, and was renamed Malone College in honor of its founders, Cleveland industrialist J. Walter Malone and his wife, Emma Brown Malone.

Today, Malone's 78-acre campus, located in a quiet residential area of Canton, Ohio, provides easy access to major metropolitan areas in northeastern Ohio, as well as the rural farmlands of the Ohio valley. Canton, home of the Professional Football Hall of Fame, offers a rich and diverse cultural life with plentiful work opportunities. While Malone is affiliated with the Evangelical Friends Church - Eastern Region, the school's focus is to serve students from all walks of life as well as the community.

The College's newest construction, The Walter O. and Mildred V. Brehme Centennial Center, a \$3,000,000 project, was completed in 1995 and offers approximately 45,000 square feet of space on two levels, housing an innovative food court-style food service, Hoover Dining Commons, a more formal Deuble Dining Room, the College bookstore and post office, as well as classrooms and offices.

With a current enrollment of over 2000 students, campus growth and development is evident with the recent opening of two residence halls designed to provide comfortable, contemporary living and study quarters. Both Heritage Hall, housing 160 students, and College Hill, housing 199 students, offer a revolutionary concept in campus living with beautifully equipped classrooms which are actually complete training facilities.

The three-story Everett L. Cattell Library houses 133,000 volumes, 1,200 periodical titles, an Instructional Communication Center, and the campus radio station. The library provides access to various electronic periodical indexes, databases, the Internet, and OCLC (which gives interlibrary loan access to libraries throughout the United States).

Perhaps the most widely recognized building on Malone's campus is the Randall Campus Center, popularly known as "The Barn." This completely remodeled lodge-style social center offers Malone students a unique environment in which to "kick back" with lounges, game room, student government offices and snack bar. The Randall Campus Center also houses the College's Admissions offices.

Osborne Hall is the home of the outstanding Malone College Pioneer athletic teams and coaches. It also houses the Jessie W. Manns weight room, featuring all types of weight and exercise equipment. The most recent addition to the hall, the Stan and Dee Ewing Varsity Center, houses locker rooms used alternately by men's and women's athletics on a rotating basis.

While we're on the topic of athletics, Malone's sixteen varsity sport teams, competing in the NAIA, are known nationally for their winning records. Malone fields teams in men's basketball, baseball, cross-country, golf, football, soccer, tennis, and indoor and outdoor track. Women's sports include basketball, cross-country, softball, tennis, indoor and outdoor track, and volleyball. Over the last decade, over 100 Malone athletes have received All-American status. The 1995 Malone College Pioneer football team (10-1-1) is one of only nine collegiate teams in history to have made it to play-offs in only the third year of the team's existence.

The ingredient that makes Malone College a leader in preparing students for the future is its wide variety of outstanding academic programs. With a 16:1 student/faculty ratio, Malone College students are afforded individual attention and encouragement to succeed. The College offers a complete liberal arts program in any major field of study, including all pre-professional programs. Malone College also boasts a near-100% graduate school acceptance rate. Malone graduates have gone on to graduate study at Harvard University, Boston College, the University of Michigan, and Johns Hopkins

University. Still others have become leaders in the areas of technology, medicine, education, ministry, law, and industry. And now, Malone itself offers three graduate programs. Students can earn Master of Arts Degrees in Education, Christian Ministries and, as of January 1996, Business Administration. Malone is accredited by and associated with the following: North Central Association of Colleges and Secondary Schools, Council on Social Work Education, Ohio Board of Regents, State of Ohio Board of Nursing Education, National League for Nursing, State of Ohio Department of Education, Coalition for Christian Colleges and Universities, Christian College Consortium, and the Ohio Foundation of Independent Colleges. Setting pace with current trends in education, Malone offers very successful degree completion programs in business management and nursing. The Malone College Management Program (MCMP) allows a full-time working adult to realize his or her potential by earning a bachelor's degree while maintaining current employment. The nursing degree completion program allows a current RN to earn a Bachelor of Science in Nursing degree.

With the cost of higher education being such an important consideration these days, Malone pursues an aggressive financial aid award policy with nearly 80% of its students receiving some type of financial assistance. The College Personnel Office, through the Student Work Program, assists students throughout the year in securing part-time employment while attending Malone. In addition to the many on-campus jobs, this office annually helps over 200 students find off-campus work in the Canton-Akron area.

It is no wonder that a lot of excitement is taking place at Malone College. With beautiful new buildings, expanding academic programs, and winning athletics, Malone College has emerged as a leader in Christian higher learning and looks forward to taking on the challenges of its second century.

SPECIAL EVENT

Friday, May 3, 1996

9:00 AM - 4:00 PM Concurrent Spring Meeting of
The Ohio Alliance for the
Environment [Additional \$15
registration fee required for those
attending the Academy's meeting.]

Using Science in Environmental Decision Making: A Pathway to Sustainability

Randall Campus Center
Stewart Community Room
Irene Probasco - Presiding

SCIENCE IS EXPECTED to be the basis for environmental decision making, but it is increasingly evident that it has become difficult for the public to evaluate the results of scientific studies. Therefore, it is hard to agree on what actions to take. Part of the controversy has to do with differing scientific judgments about what really works. Topics covered at this seminar will explore ways to improve the use of science in decisions made on environmental issues especially at local levels.

This seminar returns the Ohio Alliance to its roots as an environmental education organization when it was formed by a special committee of The Ohio Academy of Science in 1977.

The information covered will be of interest to public affairs managers, naturalists, educators, lawyers, scientists, planners, local elected officials, consultants, city, county and township administrators and representatives of environmental groups.

The Ohio Alliance for the Environment (OAE) is an environmental organization that provides programs with balanced information, opportunities for discussion of diverse points of view on topics, and leadership for facilitating constructive solutions to problems. Members of this non profit environmental organization include representatives from business, education, government, industry, agriculture, religious organizations, and citizen and environmental groups.

The Alliance was established in 1977 as the result of a statewide study by The Ohio Academy of Science. Today, the Alliance is recognized by many to be a unique organization and a valuable resource for Ohio. The Alliance Board is composed of 24 representatives of the diverse environmental interests in Ohio. Board members are elected annually.

The goals and programs of The Ohio Alliance for the Environment enable it to play a unique role in the environmental affairs in the state. As the support of Alliance initiatives has grown, we are increasingly able to attract people of diverse and often conflicting interests to our conferences. Alliance offices are located at 445 King Avenue, Columbus, Ohio 43201. Phone or FAX (614)-421-7819.

9:30 AM WELCOME & INTRODUCTIONS
KARL GEBHARDT,
Ohio Farm Bureau Federation &
President of the Ohio Alliance
for the Environment

PANEL:
***How is Science Integrated into
Public Processes?***

The Courts: Exploring ways to improve the process
BOB MAYNARD, Esq. Vorys, Sater, Seymour & Pease

The Legislature: Responding to constituent's concerns
The Hon. RICHARD SCHAFRATH, The Ohio Senate

**The Media: Communicating scientific information
to the public**
BOB DOWNING, *The Akron Beacon Journal*

QUESTIONS & ANSWERS

12:00 noon Lunch on your own or -
Brehme Centennial Center
(Pre-registration by April
22 REQUIRED)

1:00 PM - 3:00 PM Concurrent workshops of
The Ohio Alliance for the
Environment

I. Examining the New Science Programs in Schools

**II. Bridging the Gap Between Public Perception &
Scientific Evaluation**

3:00 PM FEATURED SPEAKER

***Improving the Scientific Basis for
Environmental Decision Making***

DAVID BLOCKSTEIN, Ph.D.
Senior Scientist
Committee for the National Institute
for the Environment (CNIE)

QUESTIONS & ANSWERS

4:00 PM ADJOURN

WORKSHOP
Friday, May 3, 1996
1:00 PM

1:00 P.M. Timken Hall 100
Isadore Newman, Presiding

How do we assess inquiry-based science education?

THE NATIONAL SCIENCE EDUCATION Standards (NRC, 1995), in alignment with major reform movements in the United States (NSTA, 1993; Goals 2000, 1991; Project 2061 of AAAS, 1989, 1993), were formulated in an effort to better prepare our country's youth to be productive and scientifically literate citizens for their world in the twenty-first century. These reforms call for teachers to include inquiry teaching, which focuses on a more student experiential approach in learning sciences concepts, in their teaching strategies.

Aligned with the National Science Education Standards, a major focus of The Ohio Science Competency-Based Model Program is on students learning science process skills, problem solving and critical thinking skills. The state model serves as a guide for school districts to develop their own local science courses of study. Ohio's model is based on a constructivist approach using students' experiences in identifying problems; collecting, organizing and recording data; making inferences; interpreting data and drawing conclusions.

The tenets of these two documents focus on inquiry as the key to science learning, a departure from the traditional content-oriented learning. The question arises, how does one measure the performance, discovery, and inquiry skills to monitor and assess student progress in order to meet the requirements of these state and national standards?

The focus of this workshop is to discuss the issues of how to measure student progress in learning inquiry science process skills and problem solving. The following outlines the workshop:

I. The Ohio Science Model vs. the National Science Education Standards: origin, rationale, the need for standards.

II. Description of science programs developed by local districts in Ohio that try to accommodate these state and national standards.

III. Identification of assessment procedures that evaluate inquiry methods, problem solving and higher level thinking skills.

IV. Lab Session - Time will be available for an interactive session using a newly-developed CD-ROM program.

V. Roundhouse discussion of panel members including the weaknesses, strengths, areas of improvement of proposed assessment strategies.

PANEL PARTICIPANTS

CHAIR, DR. ISADORE NEWMAN, University of Akron
 DR. JOHN HIRSCHBUHL, University of Akron
 MS. ROWENA HUBLER, Ohio Department of Education
 DR. JIM JACKSON, University of Akron
 DR. KATHY SPARROW, Akron Public Schools

INTERNET WORKSHOPS

(Sessions will be repeated on Saturday, May 4, 1996)

MUST BE PRE-REGISTERED

Arranged and conducted by Paul Mullins, Youngstown State University and Dr. Deborah Whitfield, Westminster College

I - Basic Internet Tools: E-Mail and the World Wide Web

1:00 PM, Friday, May 3, 1996

Cattell Library L22

This workshop will include information on the following: How to use electronic mail, how it differs from traditional mail, when email is (and is not) appropriate, problem resolution, and finding an email address. In addition, an overview of the World Wide Web, its capabilities, potential and shortcomings will be discussed. Includes 30 minutes for lab time

II - Using the Internet for Work or Play

2:30 PM, Friday, May 3, 1996

Cattell Library L22

Assumes knowledge of electronic mail and browsing the web. This workshop will focus on productive use of the Internet, specifically the world wide web and associated tools. Discussion will include locating, saving and presenting information. The relationship between the WWW and traditional tools, such as telnet, FTP, gopher, archie, and network news, will be explored. Includes 30 minutes for lab.

III - Teaching Students to Use the Internet for Research

Robert Hogue, Asst Prof CS&IS, Youngstown State University
 3:30 PM, Saturday, May 4, 1996

Cattell Library L22

A freshman writing course that emphasizes research was taught experimentally by an interdisciplinary team. The course makes heavy use of the Internet as well as traditional research venues. A description of the course, success and problems will be presented. This would be of interest to teachers that want to incorporate use of the Internet into their classroom. It is targeted directly for research-based classes.

Sunday, May 4, 1996 FIELD TRIPS

Plant Science Field Trip: A Cinquefoil-Sedge Meadow Fen near the Wisconsinan Glacial Border

10:00AM Sunday, May 5, 1996

Meet at the Preserve Parking Lot

Emliss Ricks - Presiding

Arranged by EMLISS RICKS, Preserve Manager, Division of Natural Areas and Preserves, The Ohio Department of Natural Resources.

JACKSON BOG STATE NATURE PRESERVE protects a shrubby cinquefoil-sedge meadow fen. This plant community once was widespread in glaciated Stark County, but now is exceedingly rare. Local spring waters flowing from the bases of gravel hills of glacial till spread over marl flats which support rare and unusual Ohio plants, such as pitcher-plant, sundew, poison sumac and numerous species of sedges.

Participants should meet at the preserve parking lot at 10:00 AM. The preserve is located approximately 7 miles west of Malone College, on the south side of State Route 687 just West of State Route 241. The entrance sign reads Jackson Township Community Park. The preserve is open all day, but the guided tour will begin at 10:00 AM and last for 2 hours. No collecting will be permitted. For more information call 216-527-4230.

Geology Field Trip: Geologic Consideration in Sustainable Development: Examples in the Akron-Canton Interlobate Area

08:00AM Sunday, May 5, 1996

Parking Lot in front of Osborne Hall

James R. Bauder - Presiding

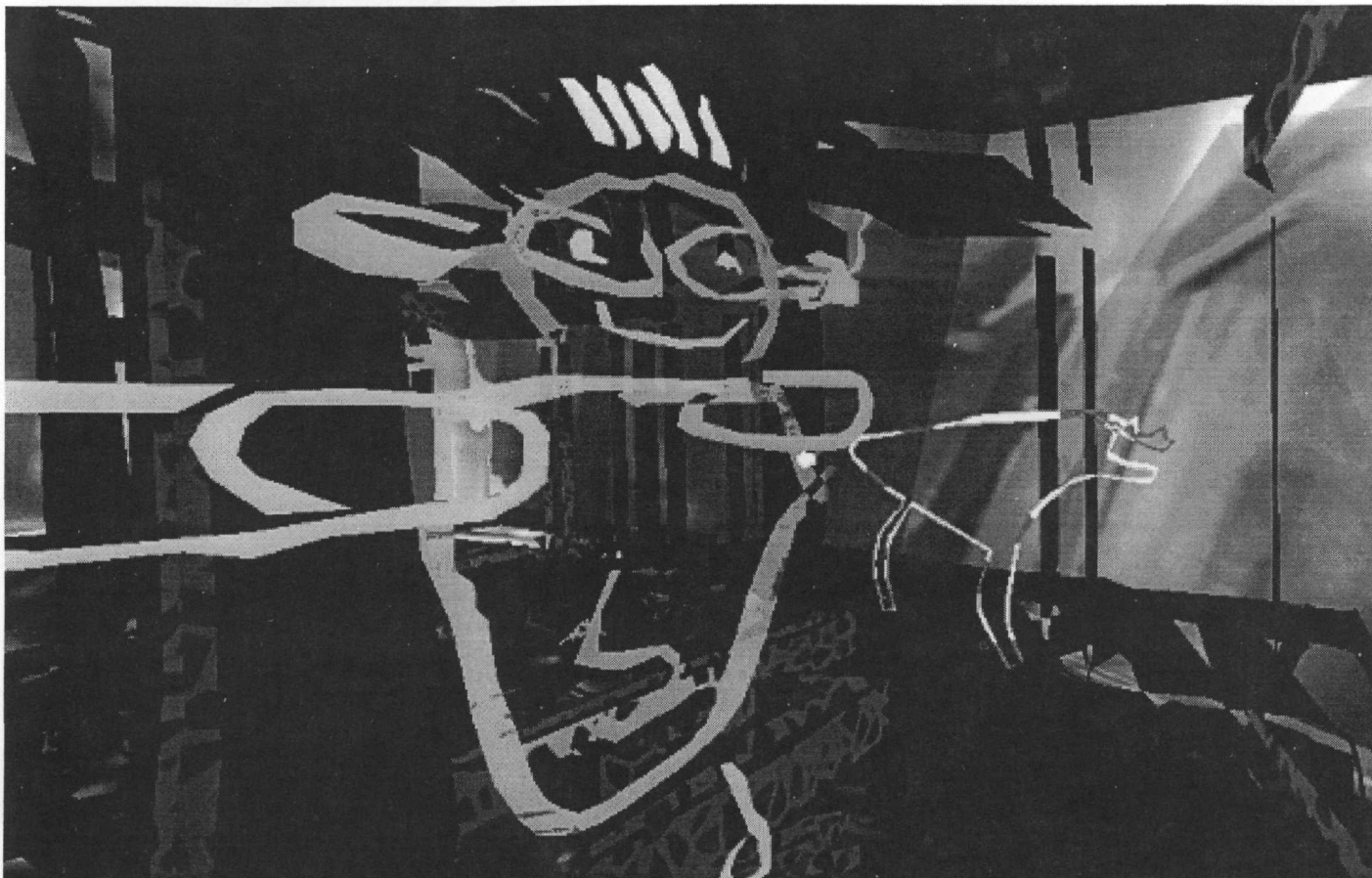
Arranged by JAMES R. BAUDER, James R. Bauder, Inc. 6106 Armistice Avenue Northwest, Canton OH 44718.

THIS AREA IS A TEXTBOOK EXAMPLE of an interlobate zone which has loamy ground moraine, kettles, kames, outwash terraces, and gorges. Rich natural resources of coal, clay, peat, sand, gravel, and ground water have been and continue to be exploited. Commercial and residential development has had to accommodate these extractive industries as well as highly variable natural geologic conditions. For example, kettles, groundwater recharge areas, are under increased development pressures as upland building sites become fewer.

We will visit several sites that exemplify the history of local community development and the geologic factors that control development potential. Stops will include: abandoned and collapsed underground coal mine sites in wooded and residential areas; an outwash terrace that has evolved from a gravel pit to a shopping center; and the groundwater recharge/discharge areas of an unnamed esker, Nobles Pond (also a Paleo-Indian site), and Jackson Bog. The field trip will end with a self-guided tour of Jackson Bog. Transportation will be in private vehicles leaving from the parking lot in front of Osborne Hall at 8:00 AM to visit sites in greater Jackson Township, Stark County. The field trip will stop for lunch, however, lunch is on your own. Just a few miles from Malone

College, the greater Jackson Township area is progressing through a developmental evolution. Attendance is limited to the first 30 registered

participants. For further information please contact SCOTT BROCKMAN, Ohio Division of Geological Survey, phone 614-265-7054.



The Power of "If"

Arranged by JACK MCWHORTER, Kent State University, Stark Campus and Professor GREGORY LITTLE, Kent State University.

AT ITS CORE THE POWER OF "If" is designed to integrate arts into basic education and to bring students and teachers together in institutes and in the classroom. The Power of "If" is a two year collaborative process that includes teachers, professional artists, scientists, and students working together. Within the realm of science, these teams will question—*What if? What are the possibilities? Can we jointly explore, learn, discover, and understand scientific concepts and demonstrate scientific principles through integration with the arts?*

Both science and the arts have long histories as separate disciplines, although both are strongly based in intuition, discovery, metaphoric transpositions, and the ability to discover and apply concepts. In general, most people look at only the end result in science instead of the entire process which preceded the end result. The arts have been reserved for the privileged few who have been gifted with special talent. Through the integrated "doing" of science and art, participants—whether they are student or teacher—will discover his or her own critical thought processes, uncover the methods by which each solves problems, begin to understand his/her ways of thinking, and create his/her own experience of science and art while learning the language and techniques of both. In short, participants will discover themselves as both "scientists" and "artists".

Caption: A single frame from a virtual world called "Flatland" — a reference to Abbott's novel of the same title. Flatland is a part of an installation created by artist and Professor Gregory Little, of Kent State University. The structures and characters that inhabit flatland were created by Stark County School Children. Professor Little selected the drawings and made each into a 3-D computer model, and assigned each character with attributes of sound and motion. The artist offers flatland as an alternative, child generated model of simulated reality, in opposition to the violent and competitive games that are so common today.

The Power of "If" will bring together professionals in art, science, and education to explore ways to create expressions of mutual learning in science and the arts. Participants will deal with phenomena that range from the simplest happening, such as the falling of a leaf, to the most complex processes of the mystery of natural forces. Using the tools acquired during the Power of If summer Institute, teachers will have the opportunity to field-test their skills within the laboratory of their classroom.

Student projects produced in collaboration with teachers, artists, and scientists will be exhibited at the Canton Museum of Art March 24-April 16, 1996.

A segment of this exhibit is being scheduled for the Academy's Annual Meeting at Malone College on May 3-4.